

# 2SK1521, 2SK1522

Silicon N-Channel MOS FET

# HITACHI

November 1996

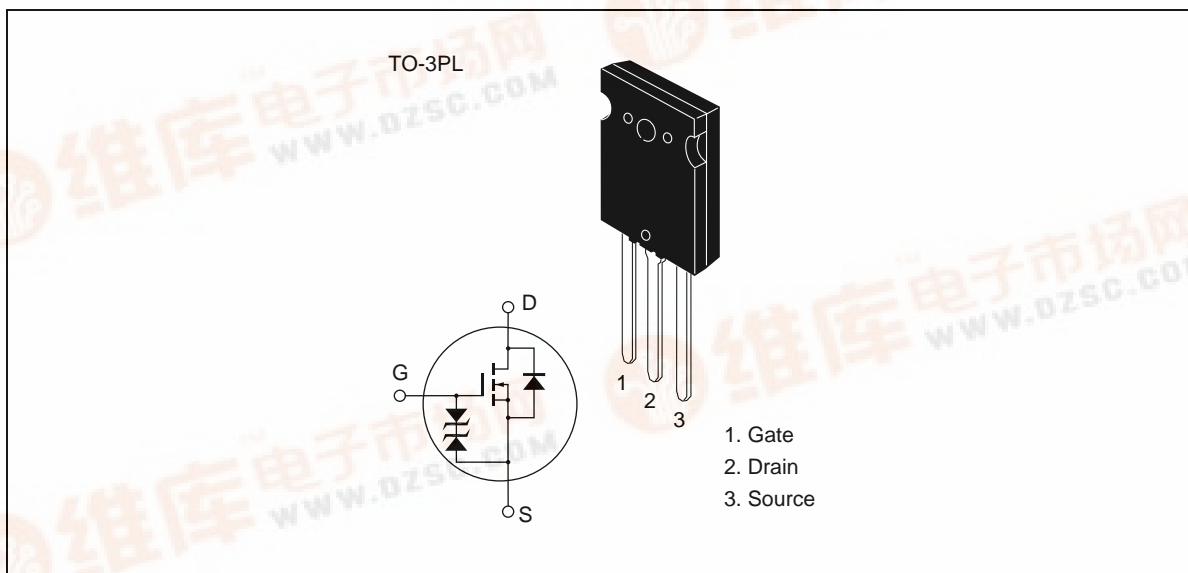
## Application

High speed power switching

## Features

- Low on-resistance
- High speed switching
- Low drive current
- Built-in fast recovery diode ( $t_r = 120$  ns)
- Suitable for motor control, switching regulator, DC-DC converter

## Outline



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### Absolute Maximum Ratings (Ta = 25°C)

Item		Symbol	Ratings	Unit
Drain to source voltage	2SK1521	$V_{DSS}$	450	V
	2SK1522		500	
Gate to source voltage		$V_{GSS}$	±30	V
Drain current		$I_D$	50	A
Drain peak current		$I_{D(pulse)}^{*1}$	200	A
Body to drain diode reverse drain current		$I_{DR}$	50	A
Channel dissipation		$Pch^{*2}$	250	W
Channel temperature		Tch	150	°C
Storage temperature		Tstg	-55 to +150	°C

Note 1.  $PW \leq 10 \mu s$ , duty cycle  $\leq 1\%$   
2. Value at  $T_c = 25^\circ C$

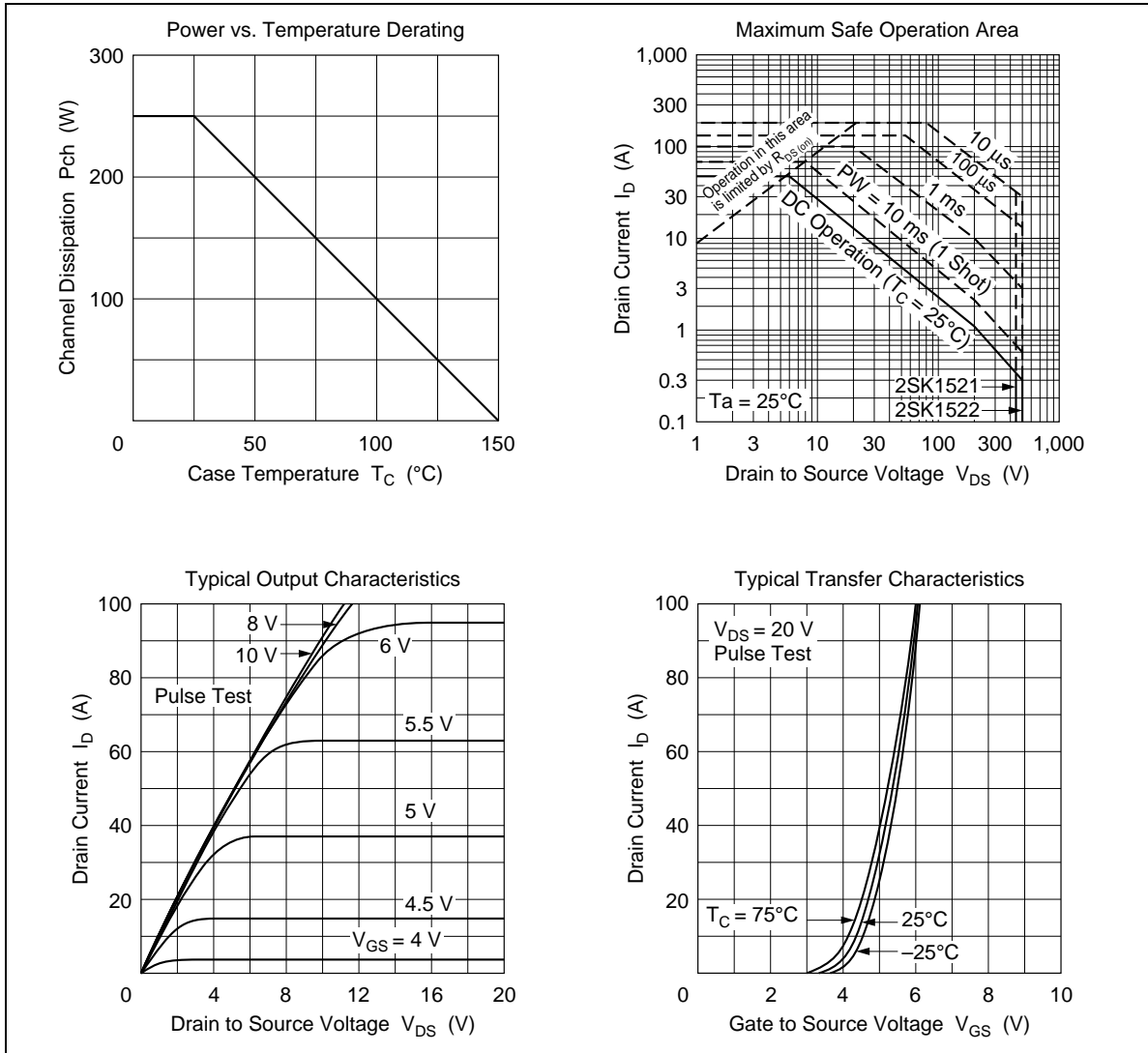
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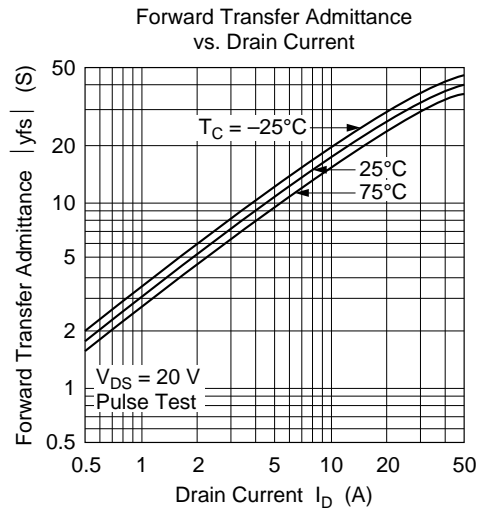
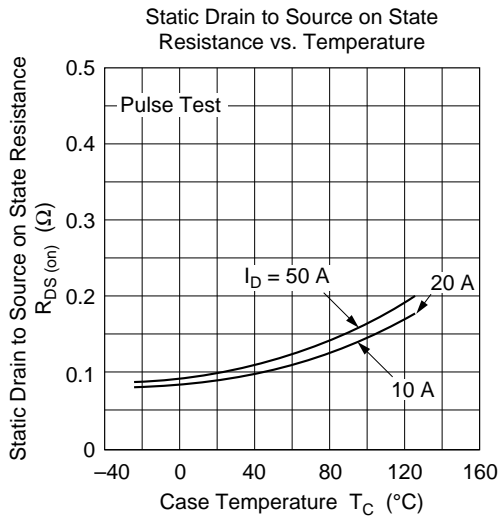
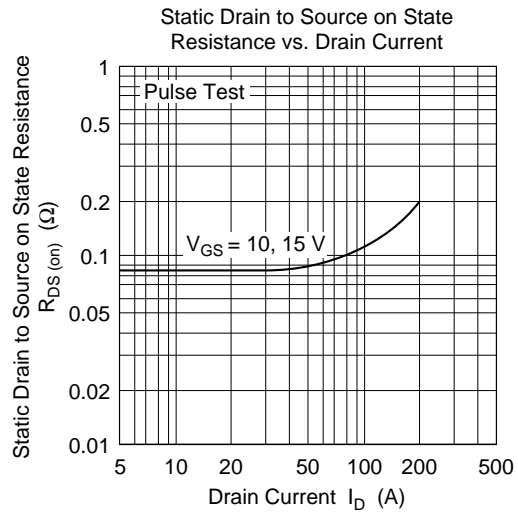
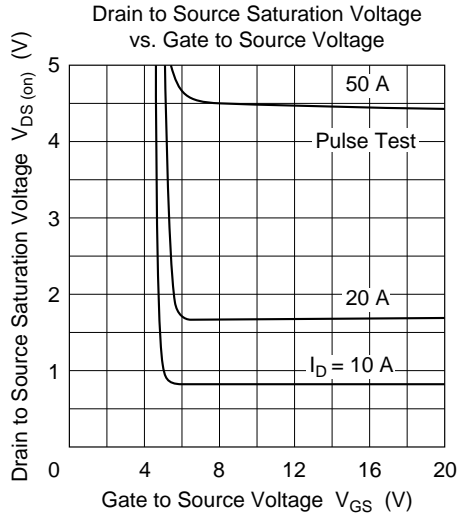
### Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	2SK1521 $V_{(BR)DSS}$ 2SK1522	450 500	—	—	V	$I_D = 10 \text{ mA}, V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	$\pm 30$	—	—	V	$I_G = \pm 100 \mu\text{A}, V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 25 \text{ V}, V_{DS} = 0$
Zero gate voltage drain current	2SK1521 $I_{DSS}$ 2SK1522	—	—	250	$\mu\text{A}$	$V_{DS} = 360 \text{ V}, V_{GS} = 0$ $V_{DS} = 400 \text{ V}, V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	2.0	—	3.0	V	$I_D = 1 \text{ mA}, V_{DS} = 10 \text{ V}$
Static Drain to source on state resistance	2SK1521 $R_{DS(on)}$ 2SK1522	— —	0.08 0.085	0.10 0.11	$\Omega$	$I_D = 25 \text{ A}, V_{GS} = 10 \text{ V}^{*1}$
Forward transfer admittance	$ y_{fs} $	22	35	—	S	$I_D = 25 \text{ A}, V_{DS} = 10 \text{ V}^{*1}$
Input capacitance	$C_{iss}$	—	8700	—	pF	$V_{DS} = 10 \text{ V}, V_{GS} = 0,$
Output capacitance	$C_{oss}$	—	2400	—	pF	$f = 1 \text{ MHz}$
Reverse transfer capacitance	$C_{rss}$	—	235	—	pF	
Turn-on delay time	$t_{d(on)}$	—	85	—	ns	$I_D = 25 \text{ A}, V_{GS} = 10 \text{ V},$
Rise time	$t_r$	—	250	—	ns	$R_L = 1.2 \Omega$
Turn-off delay time	$t_{d(off)}$	—	600	—	ns	
Fall time	$t_f$	—	250	—	ns	
Body to drain diode forward voltage	$V_{DF}$	—	1.1	—	V	$I_F = 50 \text{ A}, V_{GS} = 0$
Body to drain diode reverse recovery time	$t_{rr}$	—	120	—	ns	$I_F = 50 \text{ A}, V_{GS} = 0,$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

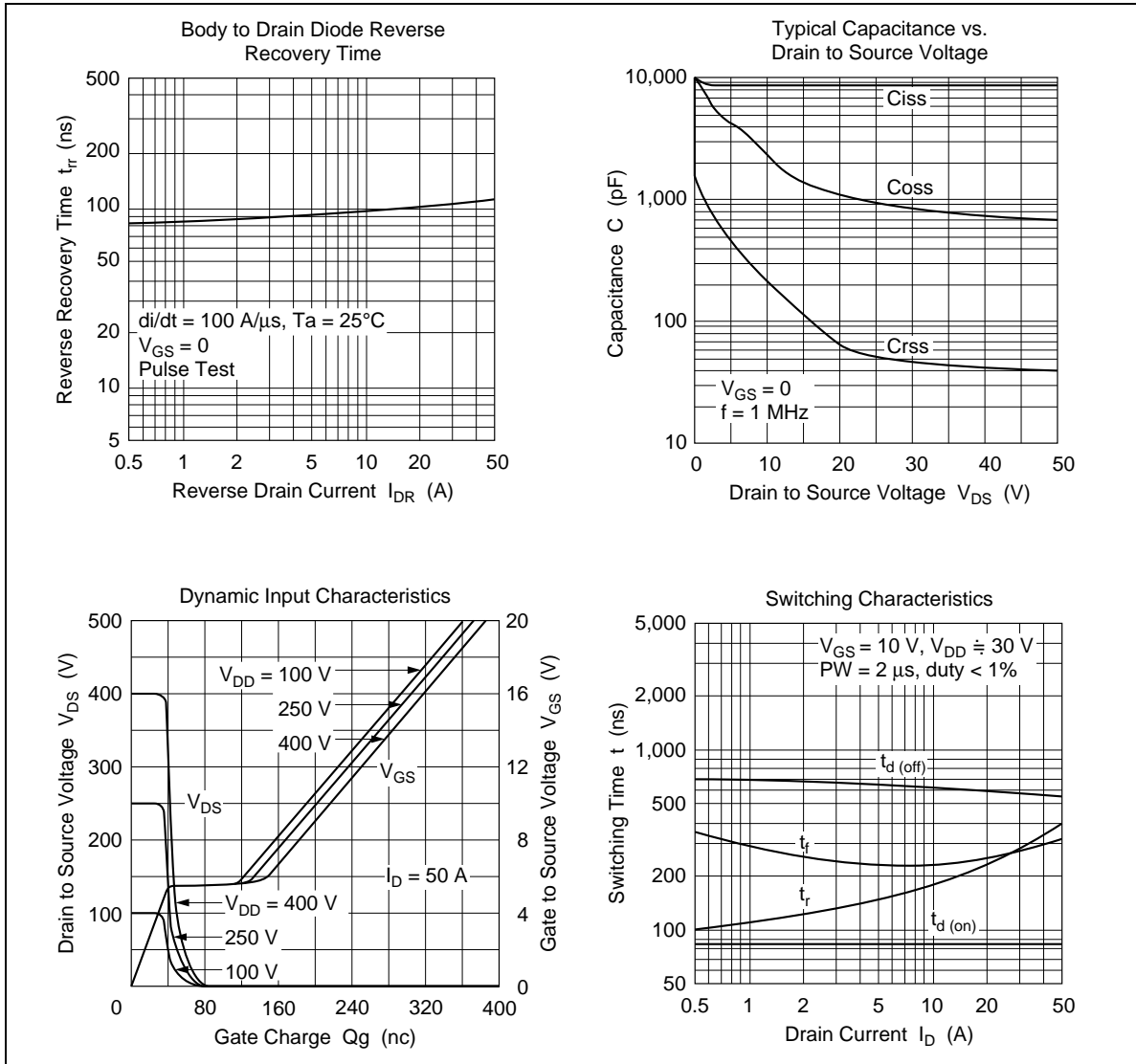
Note 1. Pulse test

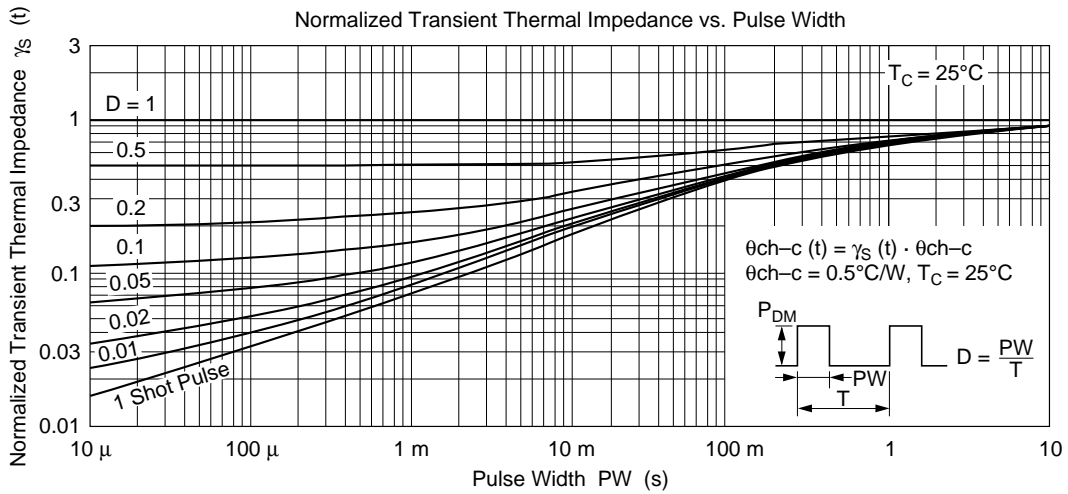
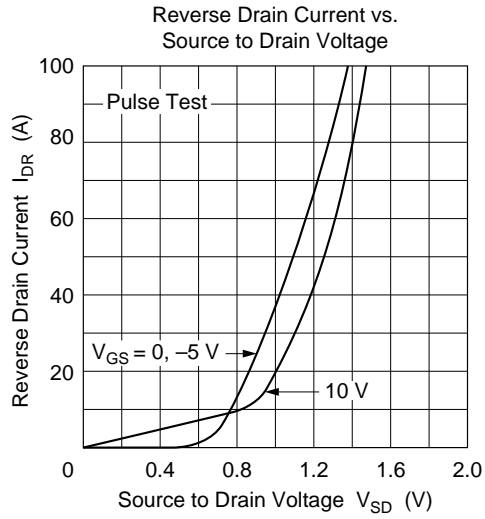
## 2SK1521, 2SK1522



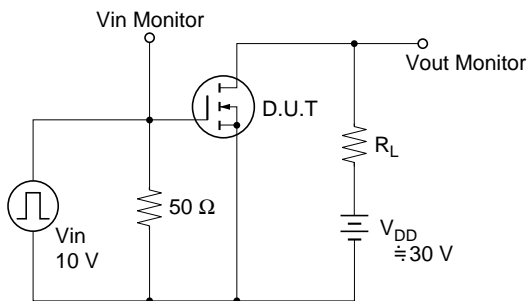


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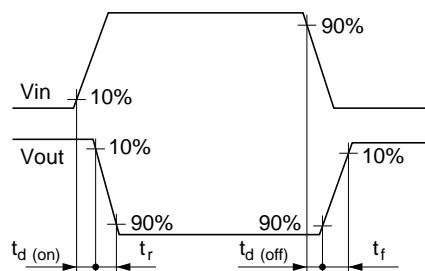




Switching Time Test Circuit



Waveforms



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